Effect of an indigenous drug formulation (churna) on clotting of mammalian blood

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Abstract

Traditional practitioners of Wedage Samaratunga Tradition of Medadumbara, Kandy, Sri Lanka uses a traditional churna consisting of ten plant ingredients (***Aralu***- *Terminalia chebula* Retz. Combretaceae, ***Bulu*** - *Terminalia belerica* Roxb. Combretaceae, ***Nelli*** - Emblica officinalis Gaertn. Euphorbiaceae, Puvak - *Areca catechu* Linn. Palmae, ***Idda*** - *Wrightia zeylanica* Br. Apocynaceae, ***Suduru*** - *Cuminum cyminum* Linn. Umbelliferae, ***Gammiris*** - *Piper nigrum* Linn. Piperaceae, Karabu - *Eugenia caryophyllus Thunb.* Myrtacea, ***Kaippu*** - *Accacia catechu Willd.* Leguminosea and ***Iramusu*** - *Hemidesmus indicus R. Br. Asclepiadaceae)* for the treatment of bleeding gum disorders. However, the effect of this *churna* on clotting of mammalian blood has not been scientifically investigated. Therefore, this study was undertaken to examine the effect of this *churna* on clotting of mammalian blood in vitro. Several concentrations of the extract (100%, 50%, 25%, 12.5%, 6.25%, 3.12% and 1.56%) were added to citrated goat's blood and clotting time was determined using Lee & White method. The result showed that all concentrations of the *churna* tested except the highest (100%) significantly shorten the clotting time ($P<0.0001$). In contrast, the results of this study lend support for the use of this *churna* in low concentrations as a clotting agent in the treatment of bleeding gums.

KEYWORDS: Mammalian blood, Clotting time

Introduction

Oral hygiene is considered and established as an integral part of general health. Globally, there are about 165 million persons affected with periodontal disorders per year. Most of the periodontal disorders (gingivitis and periodontitis) are encountered in developing countries including Sri Lanka. In Sri Lanka, about 35 % of the population still rely on herbal medicine in primary health care and there are several traditional drug formulations (churnas) prescribed by Sri Lankan traditional practioners for the treatment of gingivitis and perodontitis.

However, none of these formulations are scientifically tested for their effects on blood clotting; bleeding gums is the main clinical feature of gingivitis and periodontitis. So, we have initiated a programme to investigate the effects of locally used traditional formulations (churnas) on bleeding gum disorders on clotting of mammalian blood.

In this study, we report the effect of a churna belonging to Wedage Samaratunga tradition of Medadumbara electorate of Kandy district, Sri Lanka, on clotting of mammalian blood.

This traditional formulation (*churna*) consisting of ten plant ingredients (***Aralu*** - *Terminalia chebula* Retz. Combretaceae, ***Bulu*** - *Terminalia belerica* Roxb. Combretaceae, ***Nelli*** - *Emblica officinalis* Gaertn. Euphorbiaceae,. , ***Puvak*** - *Areca catechu* Linn. Palmae, ***Idda*** - *Wrightia zeylanica* Br. Apocynaceae, ***Suduru*** - *Cuminum cyminum* Linn. Umbelliferae, ***Gammiris*** - *Piper nigrum* Linn. Piperaceae, ***Karabu*** - *Eugenia caryophyllus* Thumb; Myrtacea, ***Kaippu*** - *Acacia catechu* Willd. Leguminosea and ***Iramusu*** - *Hemidesmus indicus* R. Br. Asclepiadaceae).

Materials and methods

The plants and their parts were authenticated by Dr. M.H.A. Tissera, Wickramarachchi Ayurvedic Institute, University of Kelaniya, Sri Lanka. All ingredients except *kaippu* (the resin of Acacia catechu) are air dried on an open field for seven days. The dried materials were finely powdered (two parts of each ingredient and one part of *kaippu*) by using roller grinder. The testing powder stored in an airtight glass container at room temperature (30° C). 0.4g of churna was dissolved in 20ml of distilled water and thoroughly mixed. Supernatent was removed using a micropippette.

	Control	Test (Concentration of Extract)						
	0.9% NaCl	1.56%	3.12%	6.25%	12.50%	25%	50%	100%
CT	3.52 ± 0.06	*1.78 ± 0.05	*2.10 ± 0.05	*1.87 ± 0.09	*2.15 ± 0.05	*2.15 ± 0.16	*2.00 ± 0.0	>20
CI	(3.0 - 5.0)	(1.5 - 2.0)	(2.0 - 2.5)	(1.5 - 2.0)	(2.0 - 2.5)	(1.0 - 3.0)	(2.0 - 0.0)	>20

*P < 0.0001 (Mann –Whitney U – test), n=20, CT- Clotting Time; CI - Confidence Interval

Table 1: Clotting effect of an indigenous drug formulation (Churna) on Mammalian blood
(Means ± SEM ranges in parentheses)

Citrated goat's blood was obtained from abbatoir in Dematagoda, Sri Lanka. Cirtration was done by using 3.1% Sodium citrate. Several concentrations of the supernatant or extract (100%, 50%, 25%, 12.5%, 6.25%, 3.125%, and 1.56%) were made using appropriate amount of normal saline. For (one) 1 ml of the different concentrations of the extracts (n=20) were added to (four) 4 ml of citrated blood and mixed well.

0.2ml of 2% $CaCl_2$ was added to these extract – blood mixtures and the clotting times were determined at room temperature using Lee & White method.

Results are expressed as means ± SEM. Statistical analyses were made using Mann – Whitney – U test. The significance level was set at $p<0.05$.

Results

Results obtained are summarized in Table 1. As shown all concentrations of the extracts except 100% caused significant ($p<0.0001$) and marked (39% - 49%) reduction in clotting time.

Conclusions

1. The *churna* at concentrations below 50% significantly shorten the clotting time seemingly in a dose – related manner. The lowest dose is the most potent.
2. The 100% churna significantly prolonged the clotting time.
3. If the results are applicable to humans it justifies the use of this *churna* in low concentrations for the treatment of bleeding gum disorders.

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